1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Code 47040
Trade Name SYSTEM 812
Manufacturer/Supplier Shipley Company
Address 455 Forest St.
Marlborough, Massachusetts 01752

Phone Number (508) 481-7950
Emergency Phone Number (508) 481-7950
Chemtrec # (800) 424-9300
MSDS first issued 2 July 1996
MSDS data revised 20 May 1998
Prepared By: Amy C. Nichols
Local Sales Company Shipley Company, 455 Forest Street, Marlboro, MA 01752
(508-481-7950)

2. COMPOSITION/INFORMATION ON THE INGREDIENTS

Components without CAS numbers are Trade Secret

<table>
<thead>
<tr>
<th>Component Name</th>
<th>CAS# / Codes</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diazo Photoactive Compound</td>
<td>100-66-3</td>
<td>1.00 - 10.00</td>
</tr>
<tr>
<td>anisole</td>
<td>97-64-3</td>
<td>20.00 - 30.00</td>
</tr>
<tr>
<td>Cresol Novolak Resin</td>
<td>624-41-9</td>
<td>42.00 - 47.00</td>
</tr>
<tr>
<td>ethyl lactate</td>
<td>628-63-7</td>
<td>2.00 - 7.00</td>
</tr>
<tr>
<td>2-Methyl Butyl Acetate</td>
<td>1319-77-3</td>
<td>0.01 - 0.99</td>
</tr>
<tr>
<td>n-amyl acetate</td>
<td></td>
<td>0.01 - 1.00</td>
</tr>
<tr>
<td>cresol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic Siloxane Surfactant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. HAZARD IDENTIFICATION

Main Hazards - Irritant - Combustible - Skin - Eye - Nervous System

Routes of Entry Inhalation, ingestion, eye and skin contact, absorption.

Carcinogenic Status Not considered carcinogenic by NTP, IARC and OSHA

Target Organs - Skin - Eye - Nervous System

Health Effects - Eyes Liquid or vapor may cause slight transient irritation.
3. **HAZARD IDENTIFICATION**

<table>
<thead>
<tr>
<th>Health Effects - Skin</th>
<th>Material may cause slight irritation on prolonged or repeated contact. Repeated or prolonged contact may produce defatting of the skin leading to irritation and dermatitis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Effects - Ingestion</td>
<td>Swallowing may have the following effects: - irritation of mouth, throat and digestive tract - nausea - vomiting - diarrhea</td>
</tr>
<tr>
<td>Health Effects - Inhalation</td>
<td>Exposure to vapor at high concentrations may have the following effects: - irritation of nose, throat and respiratory tract - dizziness - drowsiness - loss of coordination - headache - nausea - vomiting</td>
</tr>
</tbody>
</table>

4. **FIRST AID MEASURES**

<table>
<thead>
<tr>
<th>First Aid - Eyes</th>
<th>Immediately flush the eye with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Aid - Skin</td>
<td>Wash skin with water. Obtain medical attention if blistering occurs or redness persists.</td>
</tr>
<tr>
<td>First Aid - Ingestion</td>
<td>Wash out mouth with water. Obtain medical attention.</td>
</tr>
<tr>
<td>First Aid - Inhalation</td>
<td>Remove from exposure. If there is difficulty in breathing, give oxygen. Seek medical attention if symptoms persist.</td>
</tr>
<tr>
<td>Advice to Physicians</td>
<td>Treat symptomatically.</td>
</tr>
</tbody>
</table>

5. **FIRE FIGHTING MEASURES**

<table>
<thead>
<tr>
<th>Extinguishing Media</th>
<th>Use water spray, foam, dry chemical or carbon dioxide. Keep containers and surroundings cool with water spray.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Fire-Fighting Procedures</td>
<td>This product may give rise to hazardous vapors in a fire. Vapors can travel a considerable distance to a source of ignition and result in flashback.</td>
</tr>
</tbody>
</table>
5. **FIRE FIGHTING MEASURES**

   **Unusual Fire & Explosion Hazards**
   Pressure may build up in closed containers with possible liberation of combustible vapors.

   **Protective Equipment for Fire-Fighting**
   Wear full protective clothing and self-contained breathing apparatus.

6. **ACCIDENTAL RELEASE MEASURES**

   **Spill Procedures**
   Contain and absorb using earth, sand or other inert material. Transfer into suitable containers for recovery or disposal. Finally flush area with plenty of water.

   **Personal Precautions**
   Wear appropriate protective clothing. Wear respiratory protection. Eliminate all sources of ignition.

   **Environmental Precautions**
   Prevent the material from entering drains or water courses.

7. **HANDLING AND STORAGE**

   **Handling**
   Use local exhaust ventilation. Avoid contact with eyes, skin and clothing. Keep container tightly closed when not in use.

   **Storage**
   Store in original containers. Store away from sources of heat or ignition. Storage area should be:
   - cool
   - dry
   - well ventilated
   - out of direct sunlight

   **Other**
   None known.

8. **EXPOSURE CONTROLS/PERSONAL PROTECTION**

   **Occupational Exposure Standards**
   - **anisole**: None assigned.
   - **ethyl lactate**: None assigned.
   - **2-Methyl Butyl Acetate**: None assigned.
8. EXPOSURE CONTROLS/PERSOAL PROTECTION

n-amyl acetate
ACGIH: TLV 100ppm (532mg/m3) 8h TWA. OSHA: PEL 100ppm (525mg/m3) 8h TWA.

Cresol
ACGIH: TLV 5ppm (22mg/m3) 8h TWA. OSHA: PEL 5ppm (22mg/m3) 8h TWA. UK EH40: OES 5ppm (22mg/m3) 8h TWA. Can be absorbed through skin.

Engineering Control Measures
Engineering methods to prevent or control exposure are preferred. Methods include process or personnel enclosure, mechanical ventilation (local exhaust), and control of process conditions.

Respiratory Protection
Respiratory protection if there is a risk of exposure to high vapor concentrations. The specific respirator selected must be based on the airborne concentration found in the workplace and must not exceed the working limits of the respirator.

Hand Protection
Butyl rubber gloves.

Eye Protection
Chemical goggles.

Body Protection
Normal work wear.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State
Viscous liquid

Color
Red

Odor
Mild Ester

VOC (g/l)
793.31

Specific Gravity
1.066

pH
Neutral

Boiling Range/Point (°C/F)
150 / 302

Flash Point (PMCC) (°C/F)
43.3-45.6 / 110-114

Explosion Limits (%)
Lower limit ~2%

Solubility in Water
Insoluble.

Vapor Density (Air = 1)
Heavier than air.

Evaporation Rate
Slower than ether

Vapor Pressure
Ethyl Lactate: 2.0 mmHg at 20 °C.
9. PHYSICAL AND CHEMICAL PROPERTIES

Anisole: 9.7 mmHg at 42 °C.
Amyl Acetate (mix): 4.00 mmHg at 20 °C.

10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Stability</th>
<th>Stable under normal conditions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions to Avoid</td>
<td>- High temperatures - Static discharge</td>
</tr>
<tr>
<td>Incompatibilities</td>
<td>- Oxidizing agents - Bases - Acids</td>
</tr>
<tr>
<td>Hazardous Polymerization</td>
<td>Will not occur.</td>
</tr>
<tr>
<td>Hazardous Decomposition</td>
<td>- carbon monoxide - Carbon Dioxide - oxides of nitrogen - oxides of sulfur</td>
</tr>
</tbody>
</table>

11. TOXICOLOGICAL INFORMATION

| Acute Data              | ethyl lactate: Oral LD50 (mouse) 2500mg/kg. |
|                        | Anisole: Oral LD50 (rat) 3700mg/kg.         |
|                        | n-Amyl Acetate: Oral LD50 (rat) 16600mg/kg.  |
| Chronic/Subchronic Data| No data.                                    |
| Genotoxicity           | No adverse effects are expected.            |
| Reproductive/Developmental Toxicity | No adverse reproductive or fetal developmental effects are expected. |
| Additional Data         | None known.                                 |

12. ECOLOGICAL INFORMATION

| Mobility                | No relevant studies identified.            |
| Persistence/Degradability| Ethyl Lactate: COD = 0.00166g/g.           |
12. ECOLOGICAL INFORMATION

Bio-accumulation
Product is not expected to bioaccumulate.

Ecotoxicity
Ethyl Lactate: Tests on the following species gave a 48h EC50 of 683mg/litre:
- daphnia

13. DISPOSAL CONSIDERATIONS

Product Disposal
Incineration is the recommended method of disposal. Dispose of in accordance with all applicable local and national regulations.

Container Disposal
Labels should not be removed from containers until they have been cleaned. Empty containers may contain hazardous residues. Dispose of containers with care.

14. TRANSPORT INFORMATION

DOT Ground:
Not Regulated per 49 CFR 173.150(f)(2)

UN Proper Shipping Name
Flammable liquid, n.o.s.

UN Class
(3) Flammable Liquid

UN Number
UN1993

UN Packaging Group
III

N.O.S. 1:
ethyl lactate

N.O.S. 2:
Anisole

Subsidiary Risks
None.

ADR/RID Substance Identification Number
CLASS 3 - 31(c)

CERCLA RQ
Cresol (100#)

Marine Pollutant
No.

15. REGULATORY INFORMATION

TSCA Listed
All components of this product are listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory) or are exempted from listing because a Low Volume Exemption has been granted in accordance with 40
15. REGULATORY INFORMATION

TSCA Exemptions
CFR 723.50.

TSCA Sec.12(b) Export Notification
Data not available.

WHMIS Classification
D.2.B  B.3

MA Right To Know Law
All components have been checked for inclusion on the Massachusetts Substance List (MSL). Those components present at the de minimus concentration have been identified in the hazardous ingredients section of the MSDS.

California Proposition 65
This product does not contain materials which the State of California has found to cause cancer, birth defects or other reproductive harm.

SARA TITLE III-Section 311/312 Categorization (40 CFR 370)
Immediate, delayed, flammability hazard

SARA TITLE III-Section 313 (40 CFR 372)
This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

16. OTHER INFORMATION

NFPA Rating- FIRE
2

NFPA Rating- HEALTH
2

NFPA Rating- REACTIVITY
0

NFPA Rating- SPECIAL
None.

Revisions Highlighted
Composition/Information on the Components
Occupational Exposure Standards
Flash Point (PMCC) (°C/F)

Abbreviations
CAS#: Chemical Abstract Services Number
ACGIH: American Conference of Governmental Industrial Hygienists
OSHA: Occupational Safety and Health Administration
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit
NTP: National Toxicology Program
IARC: International Agency for Research on Cancer
R: Risk
16. **OTHER INFORMATION**

S:        Safety  
LD50:      Lethal Dose 50%  
LC50:      Lethal Concentration 50%  
BOD:       Biological Oxygen Demand  
TLm:       Median Tolerance Limit

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